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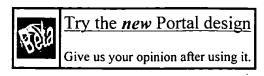
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Hoard: a scalable memory allocator for multithreaded applications Emery D. Berger, Kathryn S. McKinley, Robert D. Blumofe, Paul R. Wilson Proceedings of the ninth international conference on Architectural support for programming languages and operating systems November 2000 Volume 28, 34 Issue 5, 5	100%

Parallel, multithreaded C and C++ programs such as web servers, database managers, news servers, and scientific applications are becoming increasingly prevalent. For these applications, the memory allocator is often a bottleneck that severely limits program performance and scalability on multiprocessor systems. Previous allocators suffer from problems that include poor performance and scalability, and heap organizations that introduce false sharing. Worse, many allocators exhibit a dramatic incr ...

Hoard: a scalable memory allocator for multithreaded applications Emery D. Berger , Kathryn S. McKinley , Robert D. Blumofe , Paul R. Wilson ACM SIGPLAN Notices November 2000

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Volume 35 Issue 11

Parallel, multithreaded C and C++ programs such as web servers, database managers, news servers, and scientific applications are becoming increasingly prevalent. For these applications, the memory allocator is often a bottleneck that severely limits program performance and scalability on multiprocessor systems. Previous allocators suffer from problems that include poor performance and scalability, and heap organizations that introduce false sharing. Worse, many allocators exhibit a dramatic incr ...

A space-efficient parallel garbage compaction algorithm Wolfgang Küchlin

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Proceedings of the 5th international conference on Supercomputing June 1991

4 Creating and preserving locality of java applications at allocation and garbage collection times

99%

Yefim Shuf, Manish Gupta, Hubertus Franke, Andrew Appel, Jaswinder Pal Singh ACM SIGPLAN Notices, Proceedings of the 17th ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications November 2002

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The growing gap between processor and memory speeds is motivating the need for optimization strategies that improve data locality. A major challenge is to devise techniques suitable for pointer-intensive applications. This paper presents two techniques aimed at improving the memory behavior of pointer-intensive applications with dynamic memory allocation, such as those written in Java, First, we present an allocation time object placement technique based on the recently introduced notion of p ...

Mostly lock-free malloc

99%

Dave Dice , Alex Garthwaite

ACM SIGPLAN Notices, Proceedings of the third international symposium on Memory management June 2002

Volume 38 Issue 2 supplement

Modern multithreaded applications, such as application servers and database engines, can severely stress the performance of user-level memory allocators like the ubiquitous malloc subsystem. Such allocators can prove to be a major scalability impediment for the applications that use them, particularly for applications with large numbers of threads running on high-order multiprocessor systems. This paper introduces Multi-Processor Restartable Critical Sections, or MP-RCS. MP-RCS permits user-level ...

6 A scalable mark-sweep garbage collector on large-scale shared-|◀] memory machines

99%

Toshio Endo, Kenjiro Taura, Akinori Yonezawa

Proceedings of the 1997 ACM/IEEE conference on Supercomputing (CDROM) November 1997

This work describes implementation of a mark-sweep garbage collector (GC) for shared-memory machines and reports its performance. It is a simple "parallel" collector in which all processors cooperatively traverse objects in the global shared heap. The collector stops the application program during a collection and assumes a uniform access cost to all locations in the shared heap. Implementation is based on the Boehm-Demers-Weiser conservative GC (Boehm GC). Experiments have been done on Ultra ...

MULTILISP: a language for concurrent symbolic computation

99%

Robert H. Halstead

ACM Transactions on Programming Languages and Systems (TOPLAS) October 1985

Volume 7 Issue 4

Multilisp is a version of the Lisp dialect Scheme extended with constructs for parallel execution. Like Scheme, Multilisp is oriented toward symbolic computation. Unlike some parallel programming languages, Multilisp incorporates constructs for causing side effects and for explicitly introducing parallelism. The potential complexity of dealing with side effects in a parallel context is mitigated by the nature of the parallelism constructs and by support for abstract data types: a recommende ...

h

g e cf c 8 Concurrent compacting garbage collection of a persistent heap James O'Toole , Scott Nettles , David Gifford

99%

ACM SIGOPS Operating Systems Review , Proceedings of the fourteenth ACM symposium on Operating systems principles December 1993

Volume 27 Issue 5

We describe a replicating garbage collector for a persistent heap. The garbage collector cooperates with a transaction manager to provide safe and efficient transactional storage management. Clients read and write the heap in primary memory and can commit or abort their write operations. When write operations are committed they are preserved in stable storage and survive system failures. Clients can freely access the heap during garbage collection because the collector concurrently builds a comp ...

9 Thread-specific heaps for multi-threaded programs

98%

Bjarne Steensgaard

ACM SIGPLAN Notices , Proceedings of the second international symposium on Memory management October 2000

Volume 36 Issue 1

Garbage collection for a multi-threaded program typically involves either stopping all threads while doing the collection or involves copious amounts of synchronization between threads. However, a lot of data is only ever visible to a single thread, and such data should ideally be collected without involving other threads.

Given an escape analysis, a memory management system may allocate thread-specific data in thread-specific heaps and allocate shared data in a shared heap. Garbage $c\dots$

10 Heap architectures for concurrent languages using message passing Erik Johansson, Konstantinos Sagonas, Jesper Wilhelmsson

97%

ACM SIGPLAN Notices, Proceedings of the third international symposium on Memory management June 2002

Volume 38 Issue 2 supplement

We discuss alternative heap architectures for languages that rely on automatic memory management and implement concurrency through asynchronous message passing. We describe how interprocess communication and garbage collection happens in each architecture, and extensively discuss the tradeoffs that are involved. In an implementation setting (the Erlang/OTP system) where the rest of the runtime system is unchanged, we present a detailed experimental comparison between these architectures using bo ...

11 Portable, unobtrusive garbage collection for multiprocessor systems

97%

Damien Doligez , Georges Gonthier

Proceedings of the 21st ACM SIGPLAN-SIGACT symposium on Principles of programming languages February 1994

We describe and prove the correctness of a new concurrent mark-and-sweep garbage collection algorithm. This algorithm derives from the classical on-the-fly algorithm from Dijkstra et al. [9]. A distinguishing feature of our algorithm is that it supports multiprocessor environments where the registers of running processes are not readily accessible, without imposing any overhead on the elementary operations of loading a register or reading or initializing a field. Furthermor ...

12 An abstract machine for parallel graph reduction

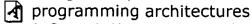
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Lal George

Proceedings of the fourth international conference on Functional programming languages and computer architecture November 1990

13 Design and performance of a coherent cache for parallel logic

97%



A. Goto, A. Matsumoto, E. Tick

ACM SIGARCH Computer Architecture News, Proceedings of the 16th annual international symposium on Computer architecture April 1989

Volume 17 Issue 3

This paper describes the design and performance of a tightly-coupled sharedmemory coherent cache optimized for the execution of parallel logic programming architectures. The cache utilizes a copy-back write-allocation protocol having five states and a hardware lock mechanism. Optimizations for logic programming are introduced in four software-controlled memory access commands: direct-write, exclusive-read, read-purge, and read-invalidate. In this paper we describe these operations and pres ...

14 A parallel, real-time garbage collector

95%

Perry Cheng , Guy E. Blelloch

ACM SIGPLAN Notices, Proceedings of the ACM SIGPLAN 2001 conference on Programming language design and implementation May 2001

Volume 36 Issue 5

We describe a parallel, real-time garbage collector and present experimental results that demonstrate good scalability and good real-time bounds. The collector is designed for shared-memory multiprocessors and is based on an earlier collector algorithm [2], which provided fixed bounds on the time any thread must pause for collection. However, since our earlier algorithm was designed for simple analysis, it had some impractical features. This paper presents the extensions necessary for a pract ...

15 An architecture for efficient Lisp list access

88%



A. R. Pleszkun , M. J. Thazhuthaveetil

ACM SIGARCH Computer Architecture News, Proceedings of the 13th annual international symposium on Computer architecture June 1986 Volume 14 Issue 2

In this paper, we present a Lisp machine architecture that supports efficient list manipulation. This Lisp architecture is organized as two processing units: a List Processor (LP), that performs all list related operations and manages the list memory, and an Evaluation Processor (EP), that maintains the addressing and control environment. The LP contains a translation table (LPT) that maps a small set of list identifiers into the physical memory addresses of objects. Essentially, the LP

16 Implementation of multilisp: Lisp on a multiprocessor Robert H. Halstead

87%



Proceedings of the 1984 ACM Symposium on LISP and functional programming August 1984

Multilisp is an extension of Lisp (more specifically, of the Lisp dialect Scheme [15]) with additional operators and additional semantics to deal with parallel execution. It is being implemented on the 32-processor Concert multiprocessor. The current

implementation is complete enough to run the Multilisp compiler itself, and has been run on Concert prototypes including up to four processors. Novel techniques are used for task scheduling and garbage collection. The task sche ...

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Conference Proceedings	on
Search	Publication Date: Sep 1993 On page(s): 1030-1040 Volume: 4, Issue: 9
O- By Author	ISSN: 1045-9219 References Cited: 22
O- Basic	CODEN: ITDSEO
O- Advanced	INSPEC Accession Number: 4582750
Member Services	Abstract:
O Join IEEE Establish IEEE Web Account	A parallel copying garbage collection algorithm for symbolic languages execut on shared-memory multiprocessors is proposed. The algorithm is an extension Baker's sequential algorithm with a novel method of heap allocation to prevent the proposed facilitate lead distribution during proposed collection.
O- Access the IEEE Member Digital Library	fragmentation and facilitate load distribution during garbage collection. An implementation of the algorithm within a concurrent logic programming syste VPIM, has been evaluated and the results, for a wide selection of benchmarks analyzed here. The authors show 1) how much the algorithm reduces the contention for critical sections during garbage collection, 2) how well the load balancing strategy works and its expected overheads, and 3) the expected sp achieved by the algorithm
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